Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of the claims in the application.

In the Claims

1. (Currently Amended) A medical device adapted for insertion into the body, comprising:

an elongated shaft having proximal end, a distal end and a central longitudinal axis; and

an electrically conductive path extending spirally about a portion of the shaft, wherein the conductive path is capable of being connected to a current source,

wherein the conductive path defines a series of coiled portions spaced from each other and includes a series of non-coiled elements extending parallel to the elongate shaft wherein a first non-coiled element is disposed between a first coiled element and a second coiled element.

2. (Original) The medical device of claim 1, wherein the shaft comprises an inner surface defining a lumen.

3. (Original) The medical device of claim 1, wherein the conductive path is defined by a material selected from the group consisting of a conductive polymer, conductive carbon, and a metal.

4. (Currently Amended) The medical device of claim 3, wherein the conductive carbon comprises amorphous carbon or carbon nanotubes.

5. (Original) The medical device of claim 3, wherein the metal is selected from the group consisting of gold, platinum, tungsten, tantalum, silver, titanium, and copper.

6. (Original) The medical device of claim 3, wherein the conductive polymer is selected from the group consisting of polyaniline, polypyrrole, and poly(ethylene-dioxythiophene).

7. (Original) The medical device of claim 3, wherein the conductive path has a thickness of less than about ten μm.

8. (Original) The medical device of claim 1, wherein a portion of the electrically conductive path is defined by a metal wire.

9. (Original) The medical device of claim 1, wherein the conductive path extends along an inner surface of the shaft.

10. (Currently Amended) The medical device of claim 1, wherein the electrically conductive path extends spirally in a first direction along the shaft, and extends spirally in a second direction counter to the first direction along the shaft such that the electrically conductive path includes a portion that wraps around the central longitudinal axis of the shaft in a clockwise direction and a portion that wraps around the central longitudinal axis of the shaft in a counter-clockwise direction.

11. (Orignal) The medical device of claim 1, wherein the shaft comprises an electrically insulating layer between portions of the conductive path.

12. (Currently Amended) The medical device of claim 11, wherein the electrically insulating layer comprises a polymer.

13. (Currently Amended) The medical device of claim 1, wherein a second non-coiled element is disposed between a third coiled element and a fourth coiled element.

14. (Currently Amended) The medical device of claim 13, wherein the conductive path defines a cylindrical band between the coiled portions, the cylindrical band defining a central longitudinal axis parallel to the central longitudinal axis of the elongated shaft.

15. (Original) The medical device of claim 1, further comprising a capacitor electrically connected to the conductive path, the conductive path and the capacitor forming an LC circuit.

16. (Original) The medical device of claim 15, wherein the capacitor is a fractal capacitor.

17. (Original) The medical device of claim 15, wherein the LC circuit has a resonance frequency tuned to a MRI frequency of the body tissue.

18. (Original) The medical device of claim 15, wherein the LC circuit has a resonance frequency tuned to a Larmor frequency of hydrogen.

19. (Currently Amended) The medical device of claim 1, further comprising a MRI contrast agent disposed in a cylindrical band having a proximal edge distal of the first coiled element and a distal edge proximal of the second coiled element.

20. (Original) The medical device of claim 19, wherein the MRI contrast agent comprises a Ti relaxation agent.

21. (Original) The medical device of claim 20, wherein the T_1 relaxation agent comprises gadolinium.

22. (Original) The medical device of claim 19, wherein the MRI contrast agent comprises a material capable of generating a magnetic susceptibility artifact.

23. (Original) The medical device of claim 22, wherein the material is selected from the group consisting of a superparamagnetic material, a paramagnetic material, a ferromagnetic material, and a diamagnetic material.

24. (Original) The medical device of claim 19, wherein the MRI contrast agent is encapsulated in a lumen, a hollow fiber, a microporous material, a channel, or a cavity.

25. (Original) The medical device of claim 19, wherein the MRI contrast agent is embedded in a material of the device.

26. (Original) The medical device of claim 19, further comprising a coating that includes the MRI contrast agent.

27. (Original) The medical device of claim 26, wherein the coating comprises a polymer selected from the group consisting of a hydrophilie polyurethane, an alginate, a polyacrylic-acrylamide copolymer, and hyaluronic acid.

28. (Original) The medical device of claim 1, further comprising an air-filled cavity.

29. (Currently Amended) The medical device of claim 1, further comprising a plurality of contrast agents arranged in a regular pattern where the plurality of contrast agents alternate with the series of coiled portions.

30. (Currently Amended) The medical device of claim 29, wherein the contrast agents comprise a T_1 relaxation agent and a material capable of generating a magnetic susceptibility artifact wherein the T_1 relaxation agent is disposed in a first series of marker bands and wherein the material capable of generating a magnetic susceptibility artifact is disposed in a second series of marker bands, wherein the second series of marker bands has a different composition than the first series of marker bands and wherein the first series of marker bands alternate with the second series of marker bands.

31. (Original) The medical device of claim 29, wherein the device comprises a radiopaque material or an ultrasound visible portion.

32. (Original) The medical device of claim 1, wherein the device is a catheter or a sheath introducer.

33. (Original) The medical device of claim 1, wherein the device is a catheter selected from the group consisting of a guide catheter, a balloon catheter, a tumor ablation catheter, an aneurysm catheter, a urology catheter, and a perfusion catheter.

34. (Original) The medical device of claim 1, wherein the device is a polymeric guide wire.

35. (Original) The medical device of claim 34, wherein the guide wire comprises polyethylene.

36. (Original) The medical device of claim 35, wherein the polyethylene has a Young's modulus of greater than about 10 GPa.

37. (Original) The medical device of claim 35, wherein the polyethylene has a tensile strength of greater than about 0.5 GPa.

38. (Currently Amended) A medical device adapted for insertion into body tissue, comprising:

a polymeric shaft having an inner surface defining a lumen; and

an electrically conductive path extending spirally about the polymeric shaft and on the inner surface of the polymeric shaft, a portion of the conductive path being defined by a first conductive coating, wherein the conductive path is capable of being connected to a current source <u>wherein the conductive path defines a series of coiled portions spaced from each other and includes a series of non-coiled elements extending parallel to the elongate shaft wherein a first non-coiled element is disposed between a first coiled element and a second coiled element</u>.

39. (Original) The medical device of claim 38, wherein the conductive path covers substantially the entire inner surface of the polymeric shaft.

40. (Currently Amended) A medical device adapted for insertion into the body, comprising:

a polymeric shaft having an inner surface defining a lumen;

an electrically conductive path extending spirally about the polymeric shaft and on the inner surface of the shaft, wherein a first portion of the conductive path is defined by a conductive coating, and a second portion of the conductive path is defined by a metal wire wherein the conductive path defines a series of coiled portions spaced from each other and includes a series of non-coiled elements extending parallel to the elongate shaft wherein a first non-coiled element is disposed between a first coiled element and a second coiled element.

41. (Original) The medical device of claim 40, wherein the second portion of the conductive path extends on the inner surface of the shaft.

42. (Currently Amended) A medical device adapted for insertion into the body, comprising:

a polymeric shaft having an inner surface defining a lumen;

an electrically conductive path, a first portion of the path extending spirally in a first direction around the central longitudinal axis of ~~along~~ the shaft, and a second portion of the path extending spirally in a second direction counter to the first direction around the central longitudinal axis of ~~along~~ the shaft, the conductive path being defined at least in part by a conductive coating; and

an insulating layer between the first and second portions of the conductive path.

43. (Original) A medical device, comprising:

a first plurality of portions comprising a first contrast agent; and

a second plurality of portions comprising a second contrast agent different than the first contrast agent,

wherein the first and second pluralities of portions are arranged in a regular pattern.

44. (Original) The device of claim 43, wherein the first contrast agent is a T_1 relaxation agent or a material capable of generating a magnetic susceptibility artifact.

45. (Original) The device of claim 43, wherein the portions of the first plurality alternate with the portions of the second plurality.

46. (Original) The device of claim 43, further comprising a third portion capable of generating a signal void.

47. (Original) The device of claim 43, further comprising a radiopaque portion or a portion that is visible by ultrasound spectroscopy.

48. (Original) A medical device, comprising:

a first plurality of portions comprising a first contrast agent; and

a second plurality of portions capable of generating a signal void,

wherein the first and second pluralities of portions are arranged in a regular pattern.

49. (Original) The device of claim 48, wherein the first contrast agent is a T_1 relaxation agent or a material capable of generating a magnetic susceptibility artifact.

50. (Original) The device of claim 48, wherein the portions of the first plurality alternate with the portions of the second plurality.